

APR 26 2002  
PATENT & TRADEMARK OFFICE  
**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

0430  
03-26-02

In re application of: Pelrine, et al.  
Application No.: 10/090,430  
Filed: February 2, 2002  
Title: Electroactive Polymer Rotary Motors

Attorney Docket No.:  
SRI1P030/US-4149-4

Examiner: Unassigned  
Group: Unassigned

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail to: Commissioner for Patents, Washington, DC 20231 on April 22, 2002.

Signed: Natalie Morgan  
Natalie Morgan

**INFORMATION DISCLOSURE STATEMENT**  
**37 CFR §§1.56 AND 1.97(b)**

Commissioner for Patents  
Washington, DC 20231

Dear Sir:

The references listed in the attached PTO Form 1449, copies of which are attached, may be material to examination of the above-identified patent application. Applicants submit these references in compliance with their duty of disclosure pursuant to 37 CFR §§1.56 and 1.97. The Examiner is requested to make these references of official record in this application.

This Information Disclosure Statement is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that these references indeed constitute prior art.

This Information Disclosure Statement is filed within three (3) months of the filing date of the above-referenced application. Accordingly, it is believed that no fees are due in connection with the filing of this Information Disclosure Statement. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 500388 (Order No. SRI1P030)

Respectfully submitted,  
BEYER WEAVER & THOMAS, LLP

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Limited Recognition Under 37 C.F.R. 10.9(b)

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Form 1449 (Modified)		Atty Docket No. <b>SRI1P030/US-4149-4</b>	Application No.: <b>10/090,430</b>
Information Disclosure Statement By Applicant  (Use Several Sheets if Necessary)		Applicant: <b>Heim, et al.</b>	Group <b>Unknown</b>
		Filing Date <b>February 2, 2002</b>	

### U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
	A1	5,977,685	11/02/99	Kurita, et al.			06/03/96
	A2	6,060,811	05/09/00	Fox, et al.			07/25/97
	A3	6,084,321	07/04/00	Hunter, et al.			08/07/98
	A4	6,184,608	02/06/01	Cabuz, et al.			12/29/98
	A5	6,184,609	02/06/01	Johansson, et al.			03/26/97
	A6	6,249,076	06/19/01	Madden, et al.			04/14/99
	A7	4,885,783	12/05/89	Whitehead, et al.			04/10/87
	A8	4,236,416	12/02/80	Barcita			9/28/78
	A9	4,240,535	12/23/80	Pierce et al.			12/23/80
	A10	4,227,347	10/14/80	Tam			9/14/78

### Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	B1	Bar-Cohen, Yoseph, JPL, <i>Worldwide Electroactive Polymers, EAP (Artificial Muscles) Newsletter</i> , Vol. 3, No.1, June 2001
	B2	Baughman, R.H., L.W. Shacklette, and R.L. Elsenbaumer, E. Plichta, and C. Becht, "Micro electromechanical actuators based on conducting polymers", in Molecular Electronics, Materials and Methods, P.I. Lazarev (ed.), Kluwer Academic Publishers, pp. 267-289 (1991)
	B3	Brock, D. L., "Review of Artificial Muscle based on Contractile Polymers," MIT Artificial Intelligence Laboratory, A.I. Memo No. 1330, Nov. 1991.
	B4	Caldwell, D., G. Medrano-Cerda, and M. Goodwin, "Characteristics and Adaptive Control of Pneumatic Muscle Actuators for a Robotic Elbow," Proc. IEEE Int. Conference on Robotics and Automation, San Diego, California (8-13 May 1994).
Examiner		Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.



Form 1040 (Modified) <b>Information Disclosure Statement By Applicant</b> (Use Several Sheets if Necessary)		Atty Docket No. <b>SRI1P030/US-4149-4</b> Applicant: <b>Heim, et al.</b> Filing Date <b>February 2, 2002</b>	Application No.: <b>10/090,430</b> Group <b>Unknown</b>
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### Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	C1	De Rossi, D., and P. Chiarelli. 1994. "Biomimetic Macromolecular Actuators," <i>Macro-Ion Characterization, American Chemical Society Symposium Series</i> , Vol. 548, Ch. 40, pp. 517-530.
	C2	Dowling, K., <i>Beyond Faraday-Non Traditional Actuation</i> , available on the World Wide Web at <a href="http://www.frc.ri.cmu.edu/~nivek/OTH/beyond-faraday/beyondfaraday.html">http://www.frc.ri.cmu.edu/~nivek/OTH/beyond-faraday/beyondfaraday.html</a> , 9 pages, 1994
	C3	Flynn, Anita M., L.S. Tavrow, S.F. Bart, R.A. Brooks, D.J. Ehrlich, K.R. Udayakumar, and L.E. Cross. 1992. "Piezoelectric Micromotors for Microrobots," <i>IEEE Journal of Microelectromechanical Systems</i> , Vol.1, No.1, pp. 44-51 (March 1992); also published as <i>MIT AI Laboratory Memo 1269</i> , Massachusetts Institute of Technology (February 1991).
	C4	Hirose, S., <i>Biologically Inspired Robots: Snake-like Locomotors and Manipulators</i> , "Development of the ACM as a Manipulator", Oxford University Press, New York, 1993, pp.170-172.
	C5	Jacobsen, S., Price, R., Wood, J, Rytting, T., and Rafaelof, M., "A Design Overview of an Eccentric-Motion Electrostatic Microactuator (the Wobble Motor)", <i>Sensors and Actuators</i> , 20 (1989) pages 1-16
	C6	Kornbluh, R., G. Andeen, and J. Eckerle, "Artificial Muscle: The Next Generation of Robotic Actuators," presented at the Fourth World Conference on Robotics Research, SME Paper M591-331, Pittsburgh, PA, September 17-19, 1991.
	C7	Kornbluh, R., Pelrine, R., Eckerle, J., Joseph, J., "Electrostrictive Polymer Artificial Muscle Actuators", IEEE International Conference on Robotics and Automation, Leuven, Belgium, 1998
	C8	Ford, V. and J. Kievet, "Technical Support Package on Traveling-Wave Rotary Actuators" NASA Tech Brief Vol. 21, No. 10, Item #145, from JPL New Technology Report NPO-19261, October 1997
Examiner		Date Considered

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Form 1449 (Modified)

**Information Disclosure  
Statement By Applicant**

(Use Several Sheets if Necessary)

Atty Docket No.  
**SRI1P030/US-4149-4**

Application No.:  
**10/090,430**

Applicant:

**Heim, et al.**

Filing Date

**February 2, 2002**

Group

**Unknown**

**Other Documents**

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	D1	Kornbluh, R. D and R. E. Pelrine., "Dexterous Multiarticulated Manipulator with Electrostrictive Polymer Artificial Muscle," ITAD-7247-QR-96-175, SRI Project Number 7247, Prepared for: Office of Naval Research, November 1996
	D2	Lang, J. M. Schlect, and R. Howe, "Electric Micromotors: Electromechanical Characteristics," Proc. IEEE Micro Robots and Teleoperators Workshop, Hyannis, Massachusetts (November 9-11, 1987).
	D3	Lawless, W. and R. Arenz, "Miniature Solid-state Gas Compressor," <i>Rev. Sci Instrum.</i> , 58(8), pp.1487-1493, August 1987
	D4	Nguyen, T., J. A. Willett and Kornbluh, R., "Robotic systems," in ONR Ocean, Atmosphere, and Space Fiscal Year 1998 Annual Reports (Dec. 1998)
	D5	Olsson, A., G. Stemme, and E. Stemme, "The First Valve-less Diffuser Gas Pump," Tenth Annual International Workshop on Micro Electromechanical Systems, Nagoya, Japan, <i>IEEE Proceedings</i> (January 26-30, 1997), pp.108-113.
	D6	R. Pelrine and Kornbluh, R., and. 1995. <i>"Dexterous Multiarticulated Manipulator with Electrostrictive Polymer Artificial Muscle Actuator,"</i> EMU 95-023, SRI International, Menlo Park, California, April 28, 1995.
	D7	Pelrine, R. and Kornbluh, "Electroactive Polymer Devices", U.S. Patent Application No. 09/619,846, filed July 20, 2000, 67 pages
	D8	Pelrine <i>et al.</i> , "Electroactive Polymer Generators", U.S. Patent Application No. 09/619,848, filed July 20, 2000, 69 pages
	D9	Pelrine, R., R. Kornbluh, and J. Joseph, "Electrostriction of Polymer Dielectrics with Compliant Electrodes as a Means of Actuation," <i>Sensors and Actuators A: Physical</i> , Vol. 64, 1998, pp.77-85.
	D10	Pelrine, R., R. Kornbluh and J. Eckerle, "Monolithic Electroactive Polymers", U.S. Patent Application No. 09/779,203, filed February 7, 2001, 47 pages
Examiner		Date Considered

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Form 11449 (Modified) Information Disclosure Statement By Applicant (Use Several Sheets if Necessary)		Atty Docket No. <b>SRI1P030/US-4149-4</b>	Application No.: <b>10/090,430</b>
		Applicant: <b>Heim, et al.</b>	Group
		Filing Date <b>February 2, 2002</b>	<b>Unknown</b>

### Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	E1	Pelrine, R., R. Kornbluh, J. Joseph, and S. Chiba, "Electrostriction of Polymer Films for Microactuators," <i>Proc. IEEE Tenth Annual International Workshop on Micro Electro Mechanical Systems</i> , Nagoya, Japan, January 26-30, 1997, pp. 238-243.
	E2	Pelrine, R., R. Kornbluh, and J. Eckerle. "Energy Efficient Electroactive Polymers and Electroactive Polymer Devices", U.S. Patent Application No. 09/779,373, filed February 7, 2001.
	E3	Pelrine, R., and J. Joseph, <i>FY 1992 Final Report on Artificial Muscle for Small Robots</i> , ITAD-3393-FR-93-063, SRI International, Menlo Park, California, March 1993
	E4	Pelrine, R., R. Kornbluh, and J. Joseph, <i>FY 1999 Final Report on Artificial Muscle for Small Robots</i> , ITAD-10162-FR-00-27, SRI International, Menlo Park, California, 2000
	E5	Pelrine, R., R. Kornbluh, Q. Pei, and J. Joseph, "High Speed Electrically Actuated Elastomers with Over 100% Strain," <i>Science</i> , Vol. 287, No. 5454, pages 1-21, 2000
	E6	Pelrine, R., Roy Kornbluh, Jose Joseph, Qibing Pei, Seiki Chiba "Recent Progress in Artificial Muscle Micro Actuators," , SRI International, Tokyo, 1999 MITI/NEEDOIMNIC, 1999
	E7	Smela, E., O. Inganäs, Q. Pei, and I. Lundström, "Electrochemical Muscles: Micromachining Fingers and Corkscrews, "Advanced Materials, Vol.5, No. 9, pp.630-632, September 1993
	E8	Wax, S. G. and R. R. Sands, "Electroactive Polymer Actuators and Devices," Proceedings of the SPIE International Symposium on Smart Structures and Materials: Electro-Active Polymer Actuators and Devices, March 1-2, 1999, Newport Beach, California, USA., pp. 2-10.
	E9	Winters, J., "Muscle as an Actuator for Intelligent Robots", Robotics Research:Trans. Robotics International of SME, Scottsdale, AZ (August 21, 1986)
Examiner		Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

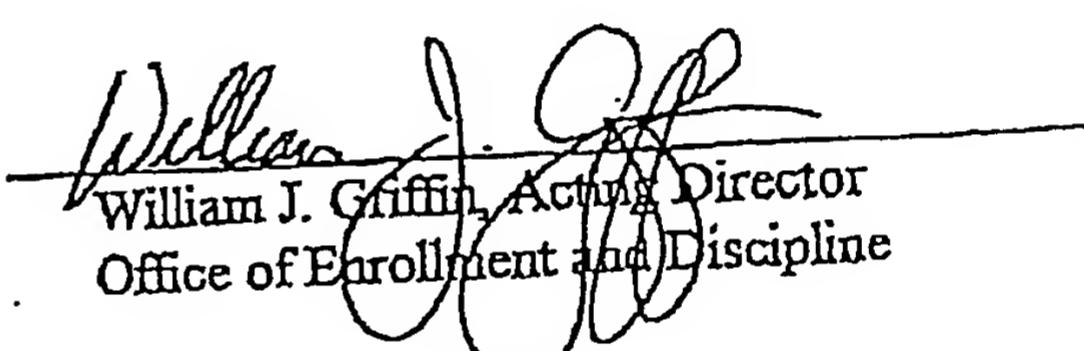


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Expires: June 10, 2002

  
William J. Griffin, Acting Director  
Office of Enrollment and Discipline